

A CONTRIBUTION TO THE ORNITHOLOGY OF
SOUTH CAROLINA, CHIEFLY THE
COAST REGION.

BY ARTHUR T. WAYNE.

Podilymbus podiceps. PIED-BILLED GREBE.—An abundant resident, breeding in freshwater ponds or large rice field 'back-waters' where the water is generally from four to ten feet deep. The number of eggs ranges from six to eight, and incubation begins as early as the first week in April in some forward seasons. After the breeding season is over both young and adult betake themselves to the salt water creeks,—very rarely going as far as the inlets. During the breeding season, the principle food of this species is leeches.

Anas obscura rubripes. RED-LEGGED BLACK DUCK.—A common winter and early spring resident; arriving the last week in November and remaining until the last week in March. It is always outnumbered by *obscura*, and examples of both forms are commonly shot from the same flock. Professional gunners make no distinction between the two forms—*rubripes* being considered the *very* adult of *Anas obscura*.

Tantalus loculator. WOOD IBIS.—A few individuals *winter* regularly as far north as Lat. 33°. From the middle of June until the last of October, enormous flocks, composed entirely of *young* birds, are to be seen daily on the sound in front of my house. At times the Wood Ibis is very unsuspecting and confiding. I have seen one of these birds deliberately follow a boat as long as fish were being thrown to it, one at a time, which the ibis devoured ravenously. This species breeds in some numbers in Caw-Caw swamp, Colleton County.

Botaurus lentiginosus. AMERICAN BITTERN.—During the months of May, June, and July, 1887, I saw several pairs of these birds in an enormous 'back-water' near Yemassee, S. C., where the Purple Gallinule (*Jonornis martinica*) was breeding in large numbers, but despite all my exertions I was unable to find a nest, although the young birds were seen in June. In 1890, I again

visited Yemassee, and spent eight months collecting in that locality, and although I frequently saw many Bitterns from March until October, I was unable to obtain a nest with eggs.

Hydranassa tricolor ruficollis. LOUISIANA HERON.— This heron still breeds abundantly, and both *young* and adults *winter* numerously in sheltered ponds on the coast islands.

Florida cærulea. LITTLE BLUE HERON.— Breeds in enormous numbers in the fresh-water 'reserves,' and both phases *winter* abundantly on the coast islands.

Butorides virescens. GREEN HERON.— Resident. This species *winters* in small numbers on the coast islands.

Nycticorax nycticorax nævius. BLACK-CROWNED NIGHT HERON.— Breeds sparingly, and *winters* numerously on the coast islands. While at Capers's Island, S. C., on Feb. 6, 1905, I saw in a large pond of brackish water, all congregated together, and seemingly in perfect harmony, the following species:— *Ardea herodias*, *Hydranassa tricolor ruficollis*, *Florida cærulea*, and *Butorides virescens*.

Nyctanassa violacea. YELLOW-CROWNED NIGHT HERON.— On April 20, 1896, I secured a nest and three eggs. The nest was built in a short-leaf pine, 40 feet from the ground, on the high land and half a mile from water.

This fine species breeds in the cypress swamps; generally in isolated pairs, and is as much a diurnal species as *Ardea herodias*. On April 15, 1905, I counted sixteen individuals in a radius of ten rods. The food of *violacea*, in the breeding season, is chiefly cray-fish. After the breeding season, these birds resort to the *salt* marshes, and feed chiefly upon 'fiddlers' and fish.

Himantopus mexicanus. BLACK-NECKED STILT.— About the middle of May, 1881, I observed at least two pairs of these birds in a freshwater pond, with a growth of reeds, tussocks of grass, and small myrtle bushes, on the extreme eastern end of Sullivan's Island, S. C. These birds were very noisy, and their antics so peculiar that I watched them closely for a long while. In those days my knowledge of ornithology was very limited as regards the distribution of species, and I was not aware of the importance of my discovery. The day upon which these stilts were observed, I was in quest of eggs of *Sterna antillarum*, *Rynchops*

nigra, *Ochthodromus wilsonius*, *Hæmatopus palliatus*, and *Symphemia semipalmata*, which, in those days, bred numerously on Sullivan's Island. There is no question whatever that these birds were breeding, but I did not wade into the pond on account of moccasin snakes, which were abundant. About two weeks later, a relative, who had been spending several months at Cape Canaveral, Florida, brought to me, upon his return to Charleston, several complete sets of eggs of *Himantopus mexicanus* that he had personally collected at the Cape. His description of the breeding habits of the birds left no doubt in my mind that the birds I saw were breeding. This pond was destroyed by a very severe storm before 1884, and since that discovery was made, I have failed to note again the presence of this species in South Carolina.

Philohela minor. AMERICAN WOODCOCK.—In Audubon's 'Birds of America,' Vol. VI, p. 18, he refers to this species as breeding from February to June. This is substantiated by a fine set of four eggs which were found on Capers's Island on February 13, 1903. The nest was on the ground, on a slightly rising plain, and near a wet cover. The eggs were perfectly fresh. On March 4, 1903, another Woodcock's nest was found with four freshly laid eggs, and, in company with my friend, Mr. Benj. T. Gault, of Illinois, we saw the bird incubating. These eggs, or at least two of them, are the handsomest and deepest colored that I have yet seen. Mr. J. H. Riley, in 'The Auk' for July, 1904, p. 384, asks if Woodcock eggs "fade out during incubation or without it." In reply to this question, I will say that the two sets above mentioned are the only ones I have ever seen or taken during the past twenty-five years, and as both sets were fresh and not incubated the color did not change perceptibly in the set taken February 13; while the set taken March 4 did *not* fade at all, at least in the two richly colored eggs. The Woodcock 'sings' and 'peeps' from December until the middle of March in South Carolina.

Ereunetes occidentalis. WESTERN SANDPIPER.—This species is only absent during a part of May and June on the coast. It arrives about the 8th of July in worn breeding plumage, and winters in countless thousands. It is a curious fact that of nearly all the species of Limicolæ that occur on the South Carolina coast,

and which breed in the Arctic Lands, should arrive during the first half of July — namely: — *Macrorhamphus griseus et scolopaceus*, *Tringa canutus*, *Actodromas minutilla*, *Ereunetes pusillus*, *Calidris arenaria*, *Totanus melanoleucus et flavipes*, *Numenius hudsonicus*, *Squatarola squatarola*, *Egialitis semipalmata*, *Arenaria interpres? et morinella*. *Actodromas maculata* arrives the early part of September, while *Actodromas fuscicollis* and *Pelidna alpina sakhalina* do not arrive until October.

Limosa fedoa. MARBLED GODWIT.— An excessively rare migrant. During the past twenty-five years I have taken but two specimens, as follows:— No. 443, November 3, 1884, ♀, Mount Pleasant; No. 1023, October 9, 1885, ♂, Sullivan's Island.

Bartramia longicauda. BARTRAMIAN SANDPIPER.— The 'Field Plover' is now one of the rarest of the waders that used to be abundant on this coast during both migrations. The earliest spring record upon which I have taken this fine bird is March 28, but they were generally to be seen between April 10 and 16. A pair of these birds undoubtedly bred within a half mile of my house in the year 1901, but all attempts to find the nest proved futile. On May 11, 1901, one of these birds actually followed me, as the Willet (*Symphemia semipalmata*) does in the breeding season. The nest was, or had been, in a cotton field, but must have been destroyed the previous day as the field was ploughed. When this sandpiper grew tired of hovering over me (with almost motionless wings), it would alight on the top of a dead oak tree. I have occasionally seen this bird light on the top of a dead tree in the month of March. These birds must have eventually raised a brood on this plantation, as they were seen until June 20.

Numenius longirostris. LONG-BILLED CURLEW.— The 'Spanish Curlew' is now about extinct on the South Carolina coast, where it once swarmed in countless multitudes. Since 1885, it has been supplanted by the Hudsonian Curlew (*Numenius hudsonicus*), which is still exceedingly abundant during the spring and autumnal migrations. From 1879 to 1885, *longirostris* was to be found in the immediate vicinity of Charleston, but its numbers steadily diminished year after year until at the present time it is so rare a bird that one is seldom seen; in fact I have not seen one since September 23, 1899. I do not think that *longirostris*

has been extirpated by being shot, but that it has changed its route of migration. Audubon, in his 'Birds of America,' Vol. VI, pp. 35 and 36, states, upon the authority of Dr. Bachman, that this Curlew "breeds on the islands on the coast of South Carolina," and it "places its nests so close together, that it is almost impossible for a man to walk between them, without injuring the eggs." Later writers have also asserted that this Curlew breeds abundantly on the South Atlantic coast, namely — Dr. Elliott Coues, 'Birds of the Northwest,' p. 508; 'Key to N. A. Birds,' p. 645; Prof. Daniel Giraud Elliot, 'N. A. Shore Birds,' p. 153; 'A. O. U. Check-List,' 1895, p. 97, and Wickersham, 'The Auk,' Vol. XIX, Oct., 1902, p. 353. I am of the opinion that the authors above mentioned accepted Audubon's account of Dr. Bachman's statement as a fact, and did not substantiate it by their personal experience. It may appear hypercritical to question Dr. Bachman's statement that this Curlew bred on the coast islands, but the eggs were not described by either Audubon or himself, and as far back as 1879 there were no eggs of *N. longirostris* in the Charleston Museum; while the egg of the 'Stone Curlew' (*Symphemia semipalmata*), were well represented and were classified as eggs of the Long-billed Curlew! I have been unable to obtain any evidence, even from the "oldest inhabitants," that *N. longirostris* ever bred anywhere on the South Carolina coast. The birds simply appeared in the autumn and winter, and migrated to their breeding grounds in the Northwest late in the spring. Dr. Bachman made many errors respecting the Limicolæ and I may mention a few. He stated in Audubon's 'Birds of America,' Vol. V, p. 256, that *Tringa canutus* does not occur in South Carolina, in "full plumage"; and again in Vol. VI, p. 12, he states that *Macrorhamphus griseus* does not occur in the "spring in the vicinity of Charleston." It is hardly worth mentioning that both *Tringa canutus* and *Macrorhamphus griseus* occur abundantly on the South Carolina coast during the northward migration. Both of these species attain the highest possible plumage before they start on their long journey to the Arctic Regions. In 1885, Mr. Brewster and the writer collected a very fine series of *Tringa canutus*, in the month of May on Sullivan's Island, S. C. *Macrorhamphus griseus* is in full nuptial plumage by April 28, and it is

characteristic of the males during the month of April and May to soar high in the air with wings 'set' and sing their love song. It will be seen from the above that the Long-billed Curlew will have to be excluded from the list of birds which breed in the South Atlantic States.

Numenius borealis. ESQUIMAUX CURLEW.—I have never seen this Curlew alive, but in the Museum of the College of Charleston there were many mounted specimens, that were labeled by Dr. Bachman as follows: "South Carolina, *Winter.*" All of these specimens were dust-stained and moth-eaten, and when Dr. G. E. Manigault became the curator they, among other birds, were thrown away as trash.

Ectopistes migratorius. PASSENGER PIGEON.—The only Wild Pigeon I ever saw that was killed near Charleston, was shot by a colored man on November 21, 1885, at Sineath's Station, thirteen miles north of Charleston, while he was on a 'deer stand.' I was on the station waiting for the train to go to Charleston, when two hunters came up. One of them took from his bag a young female Wild Pigeon and showed it to me with much pride. As the bird was shot with buck-shot it could not be preserved. While spending a portion of the summer of 1882 at Caesar's Head, Greenville County, South Carolina, I saw two pairs of these birds near the summit of the mountain.

Ictinia mississippiensis. MISSISSIPPI KITE.—This fine bird breeds regularly in considerable numbers near Charleston, but in the region about Yemassee it is an abundant breeding bird. A pair of these kites have bred for ten consecutive years within a mile of my house, and in the *same* nest for five years. On May 28, 1898, I succeeded in finding a man who had the courage to climb the gigantic pine in which the kite had a nest. The nest was 111 feet and 7 inches from the ground and contained one egg. This egg was sent to Dr. William L. Ralph, and is now in the Smithsonian Institution. On May 29, 1902, a single egg, which contained a good sized embryo, was taken from the same nest. The seasons of 1903 and 1904, the birds were found breeding within a hundred yards of their former nest, but the tree was so immense that I could not secure a climber. On May 27, 1905, I found that the kites had occupied the nest they had built and

used in the years 1903 and 1904, and I engaged a man who ascended the tree and lowered the single egg which it contained. This nest was 135 feet from the ground, and the egg contained a large embryo. The eggs are dull bluish-white, generally nest-stained, and measure 1.60×1.31 in. In the region about Yemassee, this kite certainly lays from two to three eggs. Mr. Chapman, in his 'Birds of Eastern North America,' states that this kite "is not common east of Louisiana." While I was on the Suwannee River, Florida, in 1892, I saw daily, between the river and a large plantation, from May 12 until May 28, *hundreds* of these birds, as well as *hundreds* of *Elanoides forficatus*. These kites arrived daily, and with the greatest regularity at 11.50 A. M., and departed at 2.08 P. M. This field was alive with grasshoppers, upon which the kites were feeding, and it was a sight that will never be forgotten.

Aquila chrysaetos. GOLDEN EAGLE.—There are two mounted specimens of this eagle in the Museum of the College of Charleston. One was taken by Thomas Porcher Ravenel, Esq. (a brother of Henry W. Ravenel, the botanist), at or near Pinopolis, South Carolina, and the other specimen was taken by Mr. S. J. L. Matthews, in St. Andrew's Parish, which is just across the Ashley River, and near the city of Charleston. Both birds were taken in the winter. The bird, which was shot by Mr. Matthews, had killed a Wild Turkey (*Meleagris gallopavo*), and it was shot while eating the Turkey. Mr. Matthews's bird is mounted in a group to illustrate how it was secured.

Dryobates borealis. RED-COCKADED WOODPECKER.—Numerous authors, including Audubon, have stated that this species breeds in *dead* pine trees. The latter, in his 'Birds of America,' Vol. IV, p. 255, says that the 'nest is not unfrequently bored in a decayed stump about thirty feet high.' I have seen perhaps a thousand holes in which this woodpecker had bred or was breeding, and *every one* was excavated in a *living* pine tree, ranging from eighteen to one hundred feet above the ground. This bird never lays its eggs until the pine gum pours freely from beneath and around the hole, and in order to accelerate the flow the birds puncture the bark to the 'skin' of the tree thereby causing the gum to exude freely. This species, unlike the Pileated Wood-

pecker, returns to the same hole year after year until it can no longer make the gum exude. But like the Pileated Woodpecker, it is much attached to the tree in which it has first made its nest, and as long as it can find a suitable spot it will continue to excavate new holes until the tree is *killed* by this process of boring. I have frequently counted as many as four holes in one tree, and in two instances I have seen as many as eight. These birds seem to know by instinct that the centre of the tree is rotten, or what lumber men call 'black-heart,' and they never make a mistake when selecting a tree! The hole is bored through the solid wood, generally a little upward, and to the center of the tree (which is always rotten), then downwards to the depth of 9 inches to a foot or more. This species lays from two to five eggs; generally three, rarely four, while five are exceptional. I have taken five eggs but once — on May 14, 1902. The earliest set taken was on April 27, 1884. Only one brood is raised, and these follow their parents during the months of July, August, and September. This Woodpecker is one of the most interesting birds we have. Its notes are harsh and discordant, and it is at all times very restless.

Ceophlœus pileatus. PILEATED WOODPECKER.— This fine woodpecker breeds regularly within a mile of my house every year. During the month of March, 1904, I made observations on a certain pair which had settled upon a dead pine as the place to excavate their hole. On March 21, the opening was commenced by the female, who drilled a small hole, and by degrees enlarged it until the hole was the size of a silver dollar. Both sexes assisted in the excavation, but the female, by far, doing most of the work. The size of the aperture was *not* increased until the shoulders of the bird was reached, when it was made a trifle larger. Every day I visited these birds in order to note the progress of their work, and being so accustomed to seeing me they were utterly fearless, as I could, at any time, approach the one excavating to within twenty feet, without hindering it in its work, although the hole was only about 30 feet from the ground. The hole was completed on April 21, and the first egg was laid the following morning. As incubation commences upon the advent of the first egg, and as the eggs are *not* laid consecutively, I did not again examine the contents of the nest until April 26,

when three eggs were found. Upon investigating the cavity on April 28, and finding but three eggs, I concluded that the set was complete and abstracted it. The excavation was made under a dead limb, and was about 18 inches deep, being hollowed out more on one side than on the other. This woodpecker is so attached to the tree in which it has first made its nest that it will continue to cling to it as long as it can find a suitable spot to excavate a new hole. It never uses the *same* hole after it has been once occupied. I know of a pair of these birds which resorted to the *same* tree for four consecutive years, and each year they excavated a *new* hole.

Another pair of these woodpeckers bred in a gigantic dead pine for three years, and as an illustration that these large holes are in great demand by other birds, and also mammals, for breeding purposes, I will state that on April 16, 1903, there were three species breeding in the *same* tree, namely — *Ceophlæus pileatus*, four eggs, 54 feet from ground; *Sciurus niger*, 70 feet from ground; and *Falco sparverius*,—approximately 90 feet from ground— all living together in perfect harmony! If this bird is deprived of its first set of eggs, it at once excavates a new hole, and the length of time consumed in its construction is about twenty-five days. A curious habit of this bird is that it frequently taps in its hole (as if excavating) even when it is incubating or brooding its young.

Chordeiles virginianus. NIGHTHAWK.—The greatest migration that I ever witnessed was of this species. On September 6, 1905, between 5.30 P. M. and sunset, these birds were migrating in dense flocks, which, at times, obscured the sky. As far as I have been able to ascertain these flocks extended over an area of more than fifteen miles from east to west. The number of birds seen must have represented *millions*. Mr. Ferdinand Gregorie, who plants on Daniel's Island, tells me that in every direction the air was filled with these valuable insectivorous birds.

The migration of Fox Sparrows (*Passerella iliaca*), that I witnessed on the morning of February 13, 1899, is insignificant in comparison to the above. (See 'The Auk,' April, 1899, p. 197.)

Spinus pinus. PINE SISKIN.—The winter of 1896 and 1897 will long be remembered on account of the great abundance of

these erratic birds. The first were observed on December 12, 1896, and many remained until the middle of March, 1897. Between these dates, many of the birds taken seemed to be in a state of perpetual moult. These birds were feeding upon the seeds of the sweet gum (*Liquidamber styraciflua*), and short-leaf pine (*Pinus mitis*).

Passerculus princeps. IPSWICH SPARROW.—Dr. Dwight states in his admirable monograph of this sparrow, p. 22, that “the yellow over the eye, acquired late in the spring moult, is equally intense in both sexes, although the individual intensity is variable,” and in the “adult in autumn the superciliary line is ashy white or only faintly tinged with yellow.” I have a specimen of this Sparrow, No. 4413, ♀ *ad.*, February 3, 1903, Cape Romain, S. C. (D. L. Taylor, collector), which has the superciliary stripe *very strongly* marked with canary yellow. The two central rectrices were being renewed, but they had not acquired their maximum length.

Ammodramus nelsoni subvirgatus. ACADIAN SPARROW.—The Acadian Sparrow is only absent on the coast from June 5 until October 10. These birds arrive in full autumnal plumage, but towards the last of October they begin to moult the feathers about the head and throat. This moult also occurs at or about the same time in all the *Ammodrami* that inhabit the salt marshes, viz:—*Ammodramus caudacutus*, *A. nelsoni*, *A. maritimus*, *A. m. fisheri*, *A. m. macgillivraii*. There is a complete moult in the spring of the above except *A. m. fisheri* and *A. m. macgillivraii*. The primaries, secondaries, and rectrices are also renewed. Audubon was well acquainted with this subspecies. In Vol. III, p. 109, of his ‘Birds of America’ he says: “Some shot on the 11th of December, in the neighborhood of Charleston in South Carolina, were so pale as almost to tempt one to pronounce them of a different species.” A “subspecies,” however, was unknown, in those days! Dr. Dwight’s description of the song in Mr. Chapman’s ‘Birds of Eastern North America’ is as perfect an imitation as one could write.

Ammodramus maritimus macgillivraii. MACGILLIVRAY’S SEASIDE SPARROW.—The type locality of this form is considered by all ornithologists to be Charleston (or vicinity), South Carolina.

Audubon, however, in his 'Orn. Biog.,' IV, 1838, p. 394, gives its range as including Louisiana and Texas; and in his 'Birds of America,' Vol. III, p. 107, he states that: "My friend Dr. Bachman informs me that none of these Finches remain in South Carolina during winter, and that they generally disappear early in November, when the weather is still very pleasant in the maritime portions of that State." My experience with this bird is exactly contrary to that of Dr. Bachman's, as it is most abundant (if such a word can be used) during the autumnal and *winter* months. Dr. Bachman may have referred to the *young*, which, however, have attained the plumage of the adult before the middle of November. *None* of these sparrows *breed* anywhere on the South Carolina coast; neither do *any* of the Seaside Sparrows; *macgillivraii*, however, must breed near at hand, as the young in first plumage occur during the second week in July, and the adult in worn breeding plumage are to be seen during the third week in July. There is a distinct northward migration which takes place about April 16, and continues until April 27, when they have all gone *north*, and of course to their breeding grounds wherever they may be.

A. m. fisheri also occurs on the South Carolina coast in company with *macgillivraii*, and I have taken numerous "typical" specimens (if the word 'typical' can be considered) in the autumnal months as well as during the *northward* migration. A 'typical' *fisheri* was taken on Oct. 27, 1893, and another *fisheri* was secured on April 16, 1901,—showing the southward as well as the northward migration.

My belief is that *A. m. peninsulae* et *A. m. fisheri* are synonyms of *macgillivraii* Audubon; and that the forms known as *peninsulae* et *fisheri* are merely variants of *macgillivraii*, as *peninsulae* is not known to *breed* on the west coast of Florida, and *fisheri* occurs in South Carolina, in the autumnal and spring months and *must breed* to the northward of South Carolina, perhaps in North Carolina.

Mr. Brewster, in 'The Auk,' April, 1890, p. 212, says that the form he "found breeding in the salt marshes at St. Mary's, Georgia, in 1877, was unmistakably *maritimus*." Macgillivray's Sparrow is said to breed on Anastasia Island and at Matanzas Inlet, Florida. (Ridgway, 'Birds of N. and M. A.' p. 216.) It therefore *breeds*

to the *southward* of the breeding range of *maritimus*, and also with it on the North Carolina coast which is indeed an anomaly! *Macgillivraii* will have to supplant *peninsulæ et fisheri*.

Vireosylva olivacea. RED-EYED VIREO.—The controlling influence upon the migration of this bird in the autumn is the presence or absence of the seeds (fruit) of the magnolia (*Magnolia grandiflora*). The fruit of this beautiful tree begins to ripen during the first week of September, but the greater part ripens through October, and many seeds remain in the cones until November. The color is coral-red, and some specimens are about three-fourths of an inch in length, but the great majority average about half an inch. These seeds contain a large amount of oil, and when this vireo has been feeding upon them for any length of time it becomes very obese. There are many beautiful trees on this plantation, and I have often sat on the steps of the old Colonial house and watched these birds while feeding upon the fruit. The tree that has the most fruit attracts nearly all the vireos in a radius of perhaps a quarter of a mile, and I have often counted as many as fifty vireos in one tree. As long as the fruit is to be had, the vireos remain, but as soon as the supply becomes scarce or exhausted, the vireos depart.

The Kingbird (*Tyrannus tyrannus*), and Redstart (*Setophaga ruticilla*), also feed upon the fruit of the magnolia.

Telmatodytes palustris marianæ. MARIAN'S MARSH WREN, and **Telmatodytes palustris griseus.** WORTHINGTON'S MARSH WREN.—Mr. Outram Bangs, in 'The Auk,' October, 1902, p. 353, says that the range of *marianæ* is "Salt marshes of western Florida, non-migratory." I think that Mr. Bangs has overlooked my record, which was the first for the Atlantic coast (see 'The Auk,' October, 1899, p. 361). On October 1, 1898, I obtained a pair (♂ and ♀) which represent the extreme type of coloration, by having the breast heavily barred and spotted. I fail to understand why this bird has been reduced to a subspecies.

Worthington's Marsh Wren is *non-migratory*, as I have already pointed out in 'The Auk,' October, 1899, p. 362. It is still an excessively rare bird and has never recovered from the losses it sustained by the great cyclone of August 27-28, 1893. When in *full adult* plumage this wren is unmistakable — being a *gray*

bird. There is no evidence that *griseus* interbreeds with *mariana*, and I think it should be give full specific rank. The breeding range of *griseus* extends along the South Carolina coast as far north as the mouth of the Santee River. A glance at the map of South Carolina, will show that there are no salt marshes of any extent from Georgetown to Southport, N. C., in which this wren could breed.

THE FEATHER TRACTS OF SWIFTS AND HUMMINGBIRDS.

BY HUBERT LYMAN CLARK.

Plates II and III.

SOME years ago I undertook to obtain material for a study of the arrangement of the feather tracts in the Swifts and Hummingbirds. Through the kindness of the authorities of the United States National Museum, the alcoholic material in that collection was placed at my disposal, and was carefully examined. Later on, some beautiful hummingbird material from Arizona came into my possession through the efforts of Mr. R. D. Lusk, and in 1897, Mr. C. B. Taylor of Kingston, Jamaica, presented me with some very valuable specimens of both swifts and hummingbirds. In April, 1901, a brief statement appeared in 'The Auk' concerning the conclusions to which the study of this material had led me, and a more extended reference to them appeared in 'Science' for January 17, 1902. The preparation of the entire report, however, was continually postponed in the hope of obtaining more specimens, and in July, 1905, through the kindness of Dr. Witmer Stone, some alcoholic hummingbirds from Brazil were loaned me by the Academy of Natural Sciences of Philadelphia. As there is little